

Protecting Yourself

During mosquito season (May to September for most of Canada), limit outdoor activities as much as possible between dusk and dawn, when mosquitos are the most active. There are mosquito species that bite humans during the day, but these have not been known to carry the West Nile Virus.

- Wear long pants and long sleeves, as well as shoes and socks when outdoors for long periods of time, or when mosquitos are most active.
- Wear loose clothes made of tightly woven materials that keep mosquitos away from the skin.
- Use mosquito netting when sleeping outdoors or in an unscreened structure and to protect small babies when outdoors.
- Install bat and bird houses on your property. Bats and birds, such as swallows and purple martins, eat millions of mosquitos.
- If you choose to use an insect spray in the patio and garden area, be sure to follow label directions carefully.
- Citronella candles used outdoors around patios, picnic tables and decks to repel mosquitos are not very effective mosquito control options.
- Bug zappers (electrocutor traps) placed out of doors have not been proven effective in reducing or eliminating mosquito populations.
- Electronic "mosquito repellers" that emit high frequency sound do not repel mosquitos.
- Claims that certain plants placed around a porch or deck will repel mosquitos are not supported by scientifically based test results.
- Repair or replace old and torn screens in doors, windows and vents that no longer prevent mosquitos from entering your home. Repair any other possible access points into your home.
- If mosquitos get into your home, you might find them resting on walls, under sinks, in closets or the basement. If you use a commercial insect spray, be sure to follow label instructions carefully.

Personal Insect Repellents

For information on the effective and safe use of personal insect repellents, see Health Canada's fact sheet, Safety Tips on Using Personal Insect Repellents found at <http://nile.healthcanada.net>.

For further information on pest control products and issues, contact the PMRA Information Service or visit the web site.



Remember

Before Purchasing a Pesticide Product

- Identify the pest correctly.
- Use physical control methods and alternatives to pesticides.
- Read the label directions and safety precautions before buying the product. The label must include the name of the pest to be controlled and the treatment location (e.g., indoor, outdoor, garden uses, pet treatment).
- Purchase only the quantity of product needed for the treatment.
- Alternatively, you may choose to hire a licensed pest control operator.

When Using a Pesticide

- Carefully read all label instructions and precautions before using pesticides.
- Do not drink, eat or smoke while applying pesticides.
- Persons and pets should vacate the area during treatment. Cover or remove aquaria.
- If kitchen area is to be treated, cover or remove food, dishes and utensils.

After Handling a Pesticide

- Always wash your hands thoroughly after handling any pesticide product.
- Do not permit persons or pets to contact treated surfaces until residue has dried completely.
- Provide adequate ventilation of treated areas after use.
- Wipe clean all surfaces that comes in direct contact with food, such as counters, tables and stovetops, including indoor and outdoor surfaces.
- Always store pesticides out of reach of children and pets and away from food and beverages.

In Case of Accidental Poisoning

- Call a poison control centre immediately and seek medical attention.
- Take the pesticide container or label with you to the emergency facility or physician.
- Follow first aid statements on the label.
- In case of accidental poisoning of pets seek veterinary attention immediately.



When Disposing of Pesticides

Do not reuse empty pesticide containers. Wrap and dispose of in household garbage.

Unused or partially used pesticide products should be disposed of at provincially or municipally designated household hazardous waste disposal sites.

Use Common Sense

- These are general recommendations.
- Consult the label for specific instructions.
- When in doubt, contact a professional.

Pest Management Regulatory Agency
2720 Riverside Drive
Ottawa ON K1A 0K9

Pest Management Information Service

Telephone: 1-800-267-6315

From outside Canada: (613) 736-3799*

*Long distance charges apply.

Fax: (613) 736-3798

Internet: www.hc-sc.gc.ca/pmra-arla

Canada

Effective Control of Mosquitos Around Your Home

Government Publications
Health Canada Santé Canada

CAI
HW
-Z472



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Some illustrations courtesy of Virginia Tech, Dept. of Entomology

Why Are Mosquitos of Concern?

Mosquitos are known carriers of many diseases globally including West Nile Virus. Currently, West Nile Virus is causing concern in the USA and Canada. For information on West Nile Virus, please refer to the following Health Canada fact sheets on the web site hosted by the Population and Public Health Branch's Centre for Infectious Disease Prevention and Control -

<http://nile.healthcanada.net>.

- West Nile Virus - The Facts
- West Nile Virus and You
- West Nile Virus: What's Being Done to Reduce the Risk
- Safety Tips on Using Personal Insect Repellents

The Life Cycle of Mosquitos

Because they are aquatic in their immature stages, all mosquitos must have water in which to develop. The larvae cannot develop in tall grass or shrubbery, although the adults may be found resting in these spots during the day.

Eggs

The females of some mosquito species lay their eggs directly on the surface of water, in a raft of between 100 and 400 eggs. The eggs hatch in a day or so into larvae. Other species leave their eggs in a spot that will flood later, such as mud at the edge of a drying pond.



Larvae



Mosquito larvae look like worms, with no legs or wings; they are often known as "wrigglers". They need to breathe

air, so they hang from the water surface and feed there by filtering small particles from the water, but will dive to the bottom for short periods to feed or escape capture. They grow rapidly during this stage, molting four times during the next few days. On the fourth molt, they become pupae, where they form legs and wings.



Pupae

The comma-shaped pupae are also known as "tumblers" because they somersault in the water when disturbed. They cannot eat and must breathe air through two tubes on their backs. The mosquitos grow inside the pupae. When they are ready, in about two days or so, they split the pupal skin and emerge as adults.



Adults

The adult mosquitos rest on the surface of the water until they are strong enough to fly, at which time they will search for something to eat. This entire life cycle from egg to adult can be completed in less than 10 days when the temperature is favorable.



Both male and female mosquitos feed on nectar from flowers for their energy, but male mosquitos feed exclusively on nectar, while the female must have blood to produce her eggs. Most mosquitos in the wild feed on animals found in their habitat and not on people. Some

species prefer birds as hosts, while others accept many animals as hosts, including people. These species are considered pests whenever there are many of them in areas used by people, such as camp sites or picnic grounds. The female mosquito may live for as long as three weeks during the summer, and any female that lives long enough to feed on blood more than once has the potential to transmit blood-borne diseases from one animal or person to another.

The females are very specific about where they lay their eggs, and pick water suitable for their offspring. Although most mosquito species breed in clean water in the wild, many of the species that breed near your home tolerate polluted water.

Most of the 75 mosquito species found in Canada survive the winter as dormant, fertilized eggs but in a few species, such as *Culex pipiens* and *Anopheles punctipennis*, it is the fertilized females that survive the winter in cool, sheltered places such as caves, animal burrows, cellars and sewers, to take their first blood meals and lay eggs in the spring.

Mosquitos that Breed Around the Home

Mosquitos of some species can fly far from their breeding sites, so their presence in your neighbourhood does not always mean they have bred or will breed there. However, certain mosquitoes are considered domestic species because they breed around the home in small, artificial containers such as bird baths and eavestroughs. Females of some of them will feed on people, will enter your home for a meal and are significant pests.

Culex pipiens

The northern house mosquito, *Culex pipiens* is the most common mosquito in urban and suburban areas of eastern Canada and British Columbia. The larvae can be found in artificial containers and ditches, and also in natural rain puddles and ponds. They thrive in water polluted with organic wastes. The females feed mainly at night and mostly on birds, but they will also bite people both outdoors and indoors. The tendency of these females to feed on people or birds, the wild hosts of West Nile Virus, makes *Cx. pipiens* the most likely vector of West Nile Virus in North America, both from birds to birds and from birds to people. A closely related species, *Cx. restuans*, is found in eastern Canada and the prairie provinces. The larvae are found in similar sites, but the females less commonly bite people.

Ochlerotatus triseriatus

The eastern tree-hole mosquito, *Aedes triseriatus*, another fairly common pest around homes, lays its eggs in tree-holes in many hardwoods. The eggs are laid just above the water line in the tree-hole. When rain raises the water level, the eggs hatch. Tires containing decomposing organic material, such as leaves, can simulate this habitat and may be used by the eastern tree-hole mosquito as a breeding site. A single discarded tire in your yard can be the source of thousands of tree-hole mosquitos over a summer.

Other Species

Larvae of *Ochlerotatus atropalpus*, which normally live in rock pools, and those of *Anopheles punctipennis*, which normally live in ponds and marshes, are sometimes found in artificial containers near dwellings. Females of these species will bite people, and may be pests around your home. Larger bodies of water on residential properties, such as ponds, snowmelt

pools and grassy ditches, may form breeding sites for many other species, too many to name here. Some of these species are significant pests; others never bite people.

What You Can Do Around Your Home and Community

You and your neighbours can do several things to prevent mosquitos from breeding near your homes and also to protect yourselves from mosquito bites.

Controlling Breeding Sites

Since mosquitos breed in stagnant water, and can do so even in very small quantities, remove any possible breeding areas where mosquitos could lay eggs.

- Eliminate sources of standing water in your yard (for example, flower pots, gardening cans, wheelbarrows, puddles) and store items upside down that must remain in your yard, such as boats and gardening containers.
- Empty tire swings of any water and, if possible, replace the swings with other types.
- Cover any garbage, recycling or composting containers, to prevent water from accumulating in them.
- Drill holes in the bottom of containers that must be left outdoors.
- Replace water in bird baths and outdoor pet dishes at least every week to help eliminate stagnant water in them and also provide fresh water.
- Empty your rain barrel if the water is more than a week old.



- Keep your swimming pool aerated, cleaned and chlorinated, even if it is not being used.
- Dump any water that collects on your swimming pool cover.
- Turn over plastic wading pools when they're not being used. Change the water in your wading pool at least each week.
- Keep your gutters clean to prevent standing water.
- Check under shrubbery and lawn coverings for hidden containers.
- Use landscaping to eliminate water that collects in low areas on your property. Mosquitos can develop in any puddle that lasts more than 7–10 days during the summer.
- Repair any leaks from outdoor water pipes, joints or hoses. Replace washers on outdoor taps that drip.

Controlling Mosquito Larvae

Aquatic birds, frogs, fishes, beetles, water bugs and dragonflies eat many mosquito larvae. As well, you might try aerating your ornamental pond.

Mosquito larvae may also be controlled with the bacterium *Bacillus thuringiensis* var. *israelensis* (Bti), a naturally occurring microbe-based product. Bti causes minimal impact to the environment and other insect and animal species. Commercial Bti products are available for use in private ponds and farm dugouts where no water flows out beyond the property limits. A fact sheet about Bti is available from the Pest Management Regulatory Agency's (PMRA) Information Service at the numbers given on the back of this pamphlet or on the web site at www.hc-sc.gc.ca/pmra-arla.